Claims:

1. Apparatus for detecting slow and small changes of electrical signals including the sign of the changes, comprising:

-a controlled switch (2) connected in the path of the signal to be detected;

-a capacitor (3) connected with a first terminal to the switch and charged to the voltage of said signal;

-an amplifier (5) with an input connected to second terminal of the capacitor (3) and generating a pulse signal corresponding to the charge or discharge current of the capacitor having corresponding proper sign;

-a window comparator (7) having first and second reference voltages (+UK, -UK) determining a window, and a signal input connected to output of the amplifier (5) for indicating whether the output signal of the amplifier lies in the range defined by the window or it has been crossed in negative or positive directions;

-storage and logical units each having first and second storage means (8, 11); and

-a pulse generator (9) connected to control input of the controlled switch (2) to make it closed for periodically repeated sampling periods, and also connected to the storage and logical units,

wherein said first storage means storing the logical state of the window comparator (7) taken during said pulse signal with proper sign, and a predetermined section of each pulse of said pulse generator reading such stored values of said first storage means into said second storage means.

2. The apparatus as claimed in claim 1, wherein said pulse generator (9) has pulses with variable period time.

3. The apparatus as claimed in claim 1, wherein the amplifier (5) comprises RC feedback elements complementing each of said charging or discharging pulse with a

respective pulse of opposite sign, and the time of these pulses being in the same order of magnitude.

4. The apparatus as claimed in claim 1, wherein the voltage window of said window comparator (7) being adjustable to be symmetric relative to the base level of the output signal of the amplifier (5).

5. The apparatus as claimed in claim 1, wherein said first storage means being a pair of bistables (8a, 8b), having inputs gated by the inverted output of the other one in the pair, furthermore said bistables being reset by the leading edges of the sampling pulses of the pulse generator (9).

6. The apparatus as claimed in claim 1, wherein said second storage means being a pair of bistables (11a, 11b), and the storage therein occurring under the effect of the rear edges of said sampling pulses of the pulse generator (9).

7. Circuit arrangement for the exact detection of the peak value of an alternating voltage, comprising a peak detector coupled to said alternating voltage to be measured and comprising a diode and a first capacitor, a sampling capacitor (24) charged to a voltage proportional to the voltage of said first capacitor, a pair of controlled switches (23, 24) with contacts coupled to said peak detector and to said sampling capacitor (24) respectively, and means operating said switches defining first and second periods, characterized in that said peak detector comprises a first operational amplifier (21) connected between said alternating voltage to be measured and said diode and having a feedback from the output of said diode to provide a pulsating direct voltage with zero DC component, said first switch (26) in said peak detector is connected in said first periods being sampling periods between said diode and said first capacitor and in said second periods short-circuiting said first capacitor, said first capacitor being coupled to said sampling capacitor (24) through a second operational amplifier (22) and

through a contact of said second switch (23) closed in said first sampling periods, and said sampling capacitor (24) being coupled in said second periods of said second switch (23) to the output of the circuit arrangement, wherein said means for operating said switches (26, 23) defining said first sampling periods to be substantially longer than the period time of said alternating voltage and second periods shorter than said sampling periods and said periods being independent from the waveform of said alternating signal.

8. The circuit arrangement as claimed in claim 7, comprising a filter connected between the first amplifier (21) and the input.

9. The circuit arrangement as claimed in claim 7, wherein the feedback element of the second amplifier (22) is a potentiometer.

10. A method for detecting slow and small changes of electrical signals including the sign of the changes, comprising the steps of switching the signal to be detected periodically to a capacitor (3) and changing thereby its charge state taken in the previous period, examining the extent and sign of the decaying current pulse caused when said capacitor (3) has been forced to take the new charge state, if the extent of this decaying current pulse is higher than a predetermined threshold limit, storing this fact and the sign of the change till the next period, characterized by the steps of generating a single alternating wave in response to every change in the charge state of said capacitor (3) so that the DC average of the alternating wave is zero and the amplitude of the first half wave being proportional to said decaying current pulse, in said examining step examining directly said first half wave of said alternating wave as a signal representing said decaying current pulse, wherein the duration of said switching step being longer than the period time of said single alternating wave, which itself being longer than said decaying current pulse.

11. The method as claimed in claim 10, wherein depending on the accuracy how

the steepness of the changes of the electrical signal should be determined the time elapsed between subsequent sampling periods being adjusted, wherein said adjustment being unrelated to the transient processes that take place during said switching step.

12. The method as claimed in claim 10, wherein the signal to be examined being the voltage of a battery when being charged.